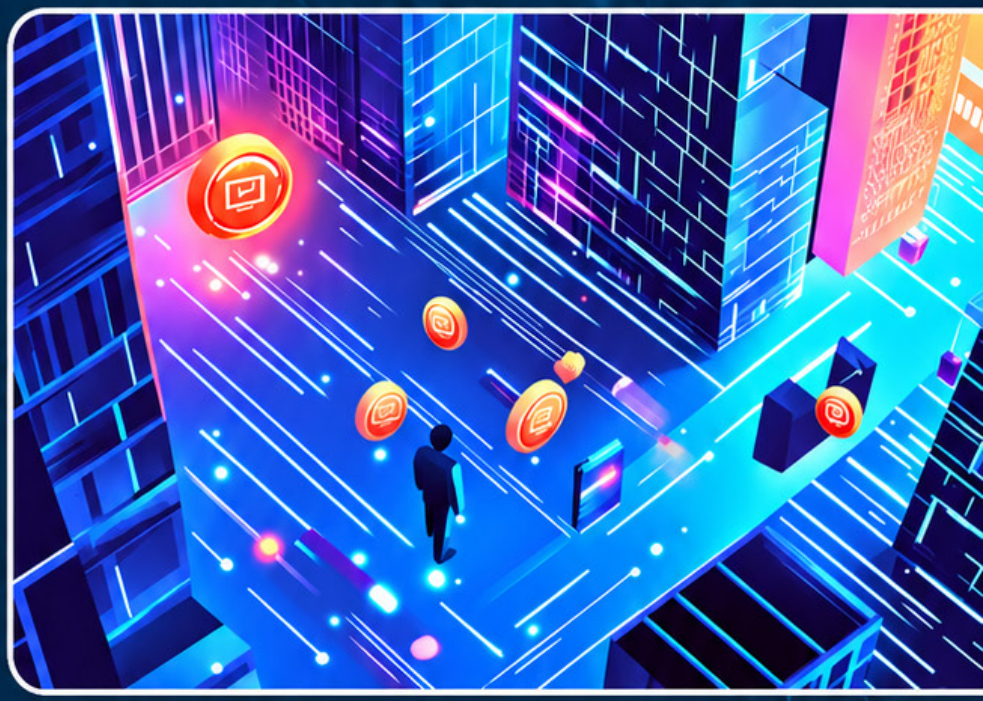
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05.01.01 – Muhandislik geometriyasi va kompyuter grafikasi. Audio va video texnologiyalari
05.01.02 – Tizimli tahlil, boshqaruv va axborotni qayta ishlash
05.01.03 – Informatikaning nazariy asoslari
05.01.04 – Hisoblash mashinalari, majmualari va kompyuter tarmoqlarining matematik va dasturiy ta'minoti
05.01.05 – Axborotlarni himoyalash usullari va tizimlari. Axborot xavfsizligi
05.01.06 – Hisoblash texnikasi va boshqaruv tizimlarining elementlari va qurilmalari
05.01.07 – Matematik modellashtirish
05.01.11 – Raqamli texnologiyalar va sun'iy intellekt
05.02.00 – Mashinasozlik va mashinashunoslik
05.02.08 – Yer usti majmualari va uchish apparatlari
05.03.02 – Metrologiya va metrologiya ta'minoti
05.04.01 – Telekommunikasiya va kompyuter tizimlari, telekommunikasiya tarmoqlari va qurilmalari. Axborotlarni taqsimlash
05.05.03 – Yorug'lik texnikasi. Maxsus yoritish texnologiyasi
05.05.05 – Issiqlik texnikasining nazariy asoslari
05.05.06 – Qayta tiklanadigan energiya turlari asosidagi energiya qurilmalari
05.06.01 – To'qimachilik va yengil sanoat ishlab chiqarishlari materialshunosligi
05.08.03 – Temir yo'l transportini ishlatish
05.08.06 – "G'ildirakli va gusenisali mashinalar va ularni ishlatish" (texnika fanlari)
05.09.01 – Qurilish konstruksiyalari, bino va inshootlar
05.09.04 – Suv ta'minoti. Kanalizatsiya. Suv havzalarini muhofazalovchi qurilish tizimlari
10.00.06 – Qiyosiy adabiyotshunoslik, chog'ishtirma tilshunoslik va tarjimashunoslik
10.00.04 – Yevropa, Amerika va Avstraliya xalqlari tili va adabiyoti
08.00.01 – Iqtisodiyot nazariyasi
08.00.02 – Makroiqtisodiyot
08.00.03 – Sanoat iqtisodiyoti
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08.00.05 – Xizmat ko'rsatish tarmoqlari iqtisodiyoti
08.00.06 – Ekonometrika va statistika
08.00.07 – Moliya, pul muomalasi va kredit
08.00.08 – Buxgalteriya hisobi, iqtisodiy tahlil va audit
08.00.09 – Jahon iqtisodiyoti
08.00.10 – Demografiya. Mehnat iqtisodiyoti
08.00.11 – Marketing
08.00.12 – Mintaqaviy iqtisodiyot
08.00.13 – Menejment
08.00.14 – Iqtisodiyotda axborot tizimlari va texnologiyalari
08.00.15 – Tadbirkorlik va kichik biznes iqtisodiyoti
08.00.16 – Raqamli iqtisodiyot va xalqaro raqamli integratsiya
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MUNDARIJA • СОДЕРЖАНИЕ • CONTENTS

MUNDARIJA

EKSPORT VA IMPORT OPERATSIYALARI ORQALI MAMLAKAT HUDUDIGA JALB QILINADIGAN INVESTITSIYALAR HISOBI 9
Misirov Asliddin, Tursunpölatova Durdona, Abdusamadov Sanjar
TRANSPORT-LOGISTIKA KOMPANIYALARIDA XALQARO YUK TAŞIŞ JARAYONLARINI SAMARALI BOŞQARIŞ 13
Kaimov Amirxon, Işmanova Dinora
ÖZBEKISTON KORXONALARIDA KOMPANIYA QIYMATINI BAHOLAŞ MUAMMOLARI (UZAUTO MOTORS AJ MISOLIDA) 19
D. Ş. Xusanova, Safarova Gulruh
ÇARM ÇIQINDILARIDAN OLINGAN KOLLAGEN GIDROLIZATINING KOMPOZITSION QOĞOZ MUSTAHKAMLIGIGA TA'SIRI 26
M. Ergaşev, R. Şerğoziyeva, O. Usmonova, M. Jörayeva
TIJORAT BANKLARINI XUSUSIYLAŞTIRIŞNING ÖZBEKISTON IQTISODIYOTIGA TA'SIRI 30
Ibadullayev Sanjar, A'zamova Muxlisa
EKSPORT-IMPORT OPERATSIYALARI BÖYIÇA XARAJATLARNI HISOBGA OLIŞ TARTIBI VA UNI TAKOMILLAŞTIRIŞ YÖNALIŞLARI 36
Misirov Asliddin, Fayzullayeva E'zoza, Qodirova Azizaxon
IJTIMOIY TARMOQLARNING ISTE'MOLÇILARNING XARID QILIŞ XATTI-HARAKATLARIGA TA'SIRI 41
Ğiyosiddinov Ozodbek , Kalanova Moxigul
DEVELOPMENT OF AN IOT-BASED REMOTE MONITORING AND AUTOMATED CONTROL SYSTEM FOR GREENHOUSE CROP GROWTH 47
Abasxanova Xalima, Sheraliyev Hasan, Hikmatullayev Habibullo, Nurbaeva Roza
SUN'IY INTELLEKT VA RAQAMLI TEXNOLOGIYALARNING IQTISODIY SAMARADORLIKKA TA'SIRI 52
Şamuratov Sardorbek, Akbarov Nodir
RAQAMLI IQTISODIYOT ŞAROITIDA MENEJMENT TIZIMINI TAKOMILLAŞTIRIŞ YÖNALIŞLARI 57
Abdukaxxorova Durdona, Hakimova Muhabbat
GLOBAL TARAQQIYOT ŞAROITIDA INTELLEKTUAL AVLOD: ILM-FAN, TA'LIM VA INNOVATSION RIVOJLANIŞ ISTIQBOLLARI 63
Inatullayeva Intizor, Öroqov Uçqun
UY XÖJALIKLARINING INSON KAPITALINI ŞAKLLANTIRIŞ VA RIVOJLANTIRIŞDAGI ROLI 68
Meylikov Fazliddin, Amrullayeva Zarina, Almardonova Farangiz
BIZNESNI TAŞKIL ETIŞNING MAQSADI VA AHAMIYATI 73
A.I. Xolbozorov, A.D. Qiryigitov, A.M. Misirov
XALQARO TA'LIM IMKONIYATLARI VA ULARNING YOŞLAR KELAJAGIDAGI AHAMIYATI 78
Omonova Nargiza, Ravşanov Xurşid
RAQAMLI IQTISODIYOT ŞAROITIDA BUXGALTER KASBINING ZAMONAVIY TALABLARI VA ISTIQBOLLARI 83
Esonturdiyeva Şaxlo, Ostonaqulov Alişer
KÖP QAVATLI TURAR JOY BINOLARIDA TAŞQI DEVOR ORQALI ISSIQLIK YÖQOTIŞLARINI KAMAYTIRIŞ VA IZOLYATSIYA QALINLIGINI OPTIMALLAŞTIRIŞ 87
Sanayev Şohzodbek, Hojiyev Dilşodbek, Qöziboyev Izzatbek, Ismoilov Şerdor, Tojinorov Diyorbek
NEUROMARKETING IS NOT ADVERTISING 96
Mahmudjonova Dinara Tursunboyevna
MOBIL ILOVALAR ORQALI XIZMAT KÖRSATUVÇI BIZNESLARNI BOŞQARIŞ STRATEGIYALARI 104
Ramazonqulov Sardorbek, Dinora Işmanova
SOCIO-ECONOMIC AND ENVIRONMENTAL EFFICIENCY OF DEVELOPING THE OLD CLOTHING RECYCLING SYSTEM IN UZBEKISTAN 108
Qulmurodova Sevinch, Boborajabova Sadoqat

SOCIO-ECONOMIC AND ENVIRONMENTAL EFFICIENCY OF DEVELOPING THE OLD CLOTHING RECYCLING SYSTEM IN UZBEKISTAN

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Abstract: This article examines the development of a system in Uzbekistan for collecting unused clothing in designated containers, sorting it, and distributing it free of charge to people in need. It analyzes opportunities to reduce textile waste, save household expenses, meet the needs of socially vulnerable citizens, and implement the principles of a circular economy in practice. Furthermore, based on existing charitable initiatives in Uzbekistan and international experience, the challenges, opportunities, and implementation mechanisms of the proposed project are assessed using SWOT analysis.

Keywords: circular economy, environmental sustainability, textile waste, reuse, social protection, cost savings, mahalla (local community), rational use of resources.

Annotatsiya: Mazkur maqolada foydalanilmayotgan kiyim-keçaklarni maxsus qutilar orqali yiğiş, saralaş va ehtiyojmand aholiga bepul tarqatiş tizimini Özbekiston şaroitida rivojlantiriş masalalari örganiladi. Kiyim-keçak çiqindilarini kamaytiriş, oilaviy xarajatlarni tejaş, ijtimoiy himoyaga muhtoj fuqarolarning ehtiyojlarini qondiriş hamda aylanma iqtisodiyot tamoyillarini amaliyotga joriy etiş imkoniyatlari tahlil qilinadi. Şuningdek, Özbekistondagi mavjud xayriya taşabbuslari va xalqaro tajriba asosida loyihaning muammolari, imkoniyatlari hamda amalga oşiriş mexanizmlari SWOT tahlili yordamida baholanadi.

Kalit sözlar: aylanma iqtisodiyot, ekologik barqarorlik, kiyim-keçak çiqindilari, qayta foydalaniş, ijtimoiy himoya, iqtisodiy tejamkorlik, mahalla, resurslardan oqilona foydalaniş.

Аннотация: В статье рассматриваются вопросы развития в условиях Узбекистана системы сбора неиспользуемой одежды в специальные контейнеры, её сортировки и бесплатной передачи нуждающимся слоям населения. Анализируются возможности сокращения текстильных отходов, экономии семейных расходов, удовлетворения потребностей социально уязвимых граждан, а также практического внедрения принципов циркулярной экономики. Кроме того, на основе существующих благотворительных инициатив в Узбекистане и международного опыта с помощью SWOT-анализа оцениваются проблемы, возможности и механизмы реализации предлагаемого проекта.

Ключевые слова: циркулярная экономика, экологическая устойчивость, текстильные отходы, повторное использование, социальная защита, экономия средств, махалля, рациональное использование ресурсов.

INTRODUCTION

Today, environmental protection, the efficient use of natural resources, and increasing the economic well-being of the population are considered interconnected tasks. The increase in consumption, the frequent renewal of clothing, and the disposal of usable products affect the efficiency of resource utilization. Given that water, energy, raw materials, and labor resources are consumed during the garment production process, extending the service life of existing clothing is both ecologically and economically important.

A study by the European Environment Agency published in 2022 notes that the production and consumption of textile products have a significant impact on water, land, raw materials, and energy resources. The study identifies extending the lifespan, reuse, and recycling of clothing as ways to reduce environmental impact [1]. This issue is of practical importance for Uzbekistan as well. Because in many households, there are clothes that are smaller in size, worn out, or not in use, but which other people can wear. At the same time, the

purchase of new clothing for some families requires additional financial costs. Thus, there is an opportunity to jointly mitigate environmental and social problems by redistributing usable clothing.

The main objective of the article is to develop a proposal aimed at saving resources, assisting the needy population, and strengthening environmental sustainability by organizing special clothing collection boxes in mahallas, apartment buildings, and educational institutions in Uzbekistan.

The research objectives include studying the theoretical foundations of clothing reuse, analyzing existing experience, identifying systemic problems, conducting a SWOT analysis, and developing criteria for evaluating the economic efficiency of the proposed project.

REVIEW OF LITERATURE ON THE SUBJECT

Directing clothing for reuse aligns with the principles of a circular economy. The essence of a circular economy is to preserve the value of products and materials for as long as possible, to reduce waste, and to use available resources efficiently. In a traditional linear economy, goods are produced, consumed, and disposed of. In a circular economy, priority is given to product repair, transfer, reuse, and, if necessary, recycling [5], [6].

In the case of clothing, this approach is as follows: a product that one person does not use but is fit to wear satisfies the needs of another person. As a result, the service life of an existing product is extended, and in some cases, the need to purchase new clothing is reduced.

At the same time, it is necessary to distinguish between the concepts of reuse and processing. During reuse, the garment continues to perform its original function. In processing, the product or the materials contained within it are processed and used to produce another product. The European Environment Agency defines reuse as the reuse of a product in its current state, pointing to its socio-economic benefits as expanding access to clothing for people in need [2].

It follows that the direct transfer of usable clothing to other people may often be more appropriate than recycling it after it has been disposed of. However, this outcome depends on the condition of the clothing, its hygienic safety, and the costs of delivering it to the new owner.

Initiatives for the free distribution of clothing and the transfer of unused items to other people have been observed in Uzbekistan before. In particular, Kun.uz's article «Good Second Hands,» published on June 6, 2022, provides information about the «Good Container» charity project in Tashkent. It highlights how used clothing, children's items, books, and other products were provided free of charge to people in need. The article also notes that during the project's operation, 10-20 people came every day to collect necessary items [3].

The article also describes the activities of an online community specializing in the free distribution of unused items. This situation indicates that there is a need and social interest among citizens to redistribute items. However, this data refers to individual initiatives in 2022 and does not currently confirm their operational status or countrywide coverage.

In addition, the Soqit platform provides users with the opportunity to offer items they do not need for free and to receive necessary items from others [4]. Clothing and footwear are also available on the platform. This indicates that a mechanism for the free exchange of goods can be developed through digital tools.

Existing experiences do not necessarily mean that the proposed initiative is entirely new. Its practical novelty can be manifested in combining existing charitable and exchange practices into a model that operates continuously at the mahalla level, with a clear management system and economic efficiency indicators.

RESEARCH METHODOLOGY

The study is based on a review of international and local sources (reports of the European Environment Agency and UNEP, the Kun.uz publication and the Soqit platform) [1–6], which was used to substantiate the theoretical foundations and to examine existing experience. The proposed system is assessed using SWOT analysis, and its economic efficiency is evaluated through formula-based indicators: the proportion of clothing suitable for reuse, the comparable market value of distributed clothing, the net economic effect, and the degree of waste reduction. The calculations rely on official data of the National Statistics Committee of the Republic of Uzbekistan [7] and on conditional examples, since the project has not yet been tested in practice; the results therefore need to be verified with real data collected during a pilot phase.

ANALYSIS AND RESULTS

Within the framework of the project, it is proposed to install special clothing collection boxes in the courtyards of apartment buildings, neighborhoods, student dormitories, and convenient areas of educational

institutions. The function of the boxes will be to receive clothing that is available to the population but is not in use and can be worn by other people.

The system operates in four main stages:

At the first stage, citizens place clean, dry, and usable clothing into special boxes. The boxes provide clear instructions on acceptable products, prohibited items, and project managers.

In the second stage, the responsible organization or volunteers will take the collected clothes according to the established schedule. Products are sorted by type, condition, and size. If necessary, washing and preparation work are organized in accordance with sanitary requirements.

In the third stage, ready-to-wear clothing will be delivered to free distribution points or delivered to citizens in need in cooperation with the mahalla and relevant social services. In the process of receiving assistance, the honor, dignity, and personal data of individuals must be protected.

In the fourth stage, the amount of clothing collected, the proportion of products suitable for reuse, the number of families who received free clothing, and the expenses incurred are taken into account. This information will serve as the basis for determining the effectiveness of the project and assessing the possibility of its expansion to other regions.

Funding for the project can be organized through sponsorship, social partnerships, local initiatives, and legal grants. At the same time, costs for the production, placement, transportation, sorting, and storage of boxes must be calculated in advance.

A number of practical problems may arise during the project implementation process. Identifying them in advance will contribute to the sustainable operation of the initiative.

The first problem is the throwing of dirty, wet, or unusable clothes into the boxes. Such products can also contaminate other clothing, causing unpleasant odors and sanitary problems. As a solution, it is necessary to clearly indicate the rules of acceptance in the boxes, regularly inspect the products and separate unsuitable clothes.

The second problem is the costs of removing and storing collected clothing. If the boxes are not emptied regularly, their surroundings may become disorderly. In order to prevent this, a schedule should be developed depending on the location, volume and filling level of the boxes.

The third problem is the identification of citizens in need and the fair distribution of clothing. Clothes may be purchased in excess by a group of people or may not reach those in real need. To eliminate this, it is necessary to establish cooperation between mahalla officials, social services, and project organizers, and, if necessary, to use clothing distribution points.

The fourth problem is people's attitude toward buying used clothes. Some citizens may be ashamed to buy such clothing or doubt its cleanliness. As a solution, it is necessary to clearly define the requirements for the sorting and hygienic preparation of clothes, to organize the distribution process in a convenient and respectful form of human dignity.

The fifth challenge is to prove the economic viability of the project. Costs for boxes and logistics may exceed expected profits. Therefore, a pilot project should first be conducted in a small area, and the costs and results should be compared.

The sixth problem is that part of the clothing is unfit for reuse. In such a situation, it is not advisable to distribute them for free. Unusable products must be directed to appropriate recycling facilities or safely disposed of in accordance with current requirements.

SWOT analysis is used to assess the internal strengths and weaknesses of the proposed system, as well as external opportunities and threats. The following analysis is based on the approximate organizational characteristics of the project, given that it has not yet been tested in all regions (Table 1).

Table 1. SWOT analysis[1]

Strengths	Weaknesses
The possibility of reducing certain family expenses by providing clothing free of charge.	Expenses required for boxes, transportation, sorting, and storage.
Extending the service life of functional clothing.	The need for constant monitoring of the condition and quality of clothing.
Development of generosity, solidarity, and ecological culture among the population.	Dependence on the activities of volunteers and responsible staff.
Creating convenient and simple submission opportunities at the mahalla level.	The possibility of a discrepancy arising between needs and clothing sizes.

1 Source: Author's own work.

Opportunities	Threats
Expand the project to other mahallas, universities, and residential complexes.	Disposal of unusable waste into bins and sanitary issues.
Development of cooperation with local hokimiyats, sponsors, and non-governmental organizations.	Suspension of activities due to lack of funds and volunteers.
Maintaining records of clothing and necessities through a digital platform.	The misappropriation or misallocation of clothing.
Development of a culture of reuse and reduction of textile waste.	Low trust or unwillingness of the population to accept used clothing.

Strategic solutions derived from SWOT analysis:

To take advantage of the strengths, the boxes should be installed in locations that are most frequently used by the population and are easy to monitor. If the mechanism of providing free clothing is linked to social assistance at the mahalla level, a close link will be formed between the available items and the citizens in need of them.

To minimize vulnerabilities, the number of boxes, their release schedule, sorting location, and responsible persons will be determined before the project begins. Instead of spending a lot of money on each box separately, you can start with a few boxes and a common sorting point.

Cooperation with educational institutions, mahalla organizations, entrepreneurs, and charitable initiatives is important in utilizing external opportunities. If the digital accounting system records how much clothing was collected and how much product was distributed, transparency and accountability will increase.

To minimize threats, the boxes must be closed, weatherproofed, and clearly marked. It is necessary to develop a procedure for the collection, sorting, and distribution of clothing, as well as to create a mechanism for receiving complaints and appeals in the draft.

The economic efficiency of a recycling project is assessed based on the costs of collecting, sorting, and distributing clothing, the share of reusable products, and the possibility of reducing the population's clothing costs. Fabric, water, electricity, and labor resources are consumed during the production of clothing. Therefore, the reuse of usable clothing contributes to the efficient use of available resources, extends the service life of products, and reduces waste.

According to the National Statistics Committee of the Republic of Uzbekistan, large enterprises produced garment products worth 43.1 trillion soums in 2025. This figure is 21.7% higher than in 2024 [7]. This data represents the economic volume of clothing production, but does not directly indicate the quantity of clothing produced or the amount of waste from the population's old clothing.

According to statistics on textile waste, 17,628 tons were recorded in January-November 2024, compared to 22,269.8 tons during the same period in 2025 [7]. The annual rate of change in waste volume is determined by the following formula:

$$T = ((M1 - M0) / M0) \times 100\%$$

$$T = ((22{,}269.8 - 17{,}628) / 17{,}628) \times 100\% \approx 26.33\%$$

Thus, based on the provided data, the volume of textile waste recorded in January-November 2025 increased by approximately 26.33% compared to the same period in 2024. This indicator refers to textile waste from large enterprises and is not identical to the waste of used clothing from the population.

The project's statistical process consists of four main stages: collecting old clothes, sorting them by condition, distributing the reusable part to families in need, and calculating the resulting economic results. At each stage, the quantity, mass, condition, and associated costs of the clothing are recorded.

The following formula is used to determine the proportion of clothing suitable for reuse:

$$Q = (Mr / Mj) \times 100\%$$

Where Q is the proportion of clothing suitable for reuse; Mr is the mass of clothing suitable for reuse; Mj is the total mass of the collected clothing.

For example, within the framework of a project, 1,000 kg of old clothes were collected, and as a result of sorting, 700 kg of them were found to be suitable for reuse. Then:

$$Q = (700 / 1{,}000) \times 100\% = 70\%$$

Thus, in this conditional example, 70% of the collected clothing is considered suitable for reuse. The remaining part, depending on its condition, may be allocated for repair, recycling, or disposal in the appropriate manner.

To determine the comparable market value of clothing distributed to the population, the following formula is used:

$$V = \Sigma (Ni \times Pi)$$

Here, V is the total comparable market value of the distributed clothing; Ni is the number of specific types of clothing; Pi is the comparable market price of one piece of clothing of the same type; n is the number of types of clothing.

For example, if each of 500 pieces of clothing valued at the same price is taken as an average of 80,000 soums:

$$V = 500 \times 80{,}000$$
$$V = 40{,}000{,}000 \text{ soums}$$

Thus, the comparable market value of the distributed clothing is 40 million soums. However, this does not mean that families actually saved 40 million soums. To determine the actual savings, it is necessary to study the clothing expenses of families who received assistance and analyze the results of the survey.

When assessing the net economic effect of a project, the economic benefit obtained is compared with the costs incurred for its implementation:

$$S = F - X;$$

Here, S is the net economic effect; F — economic benefit actually determined as a result of the project; X is the total cost of collecting, transporting, sorting, cleaning, repairing, storing, and distributing clothing.

For example, if the economic benefit determined as a result of the project is 30 million soums, and the total costs are 18 million soums:

$$S = 30{,}000{,}000 - 18{,}000{,}000$$
$$S = 12{,}000{,}000 \text{ soums}$$

Thus, in this conditional example, the net economic effect of the project is 12 million soums. In practical calculations, economic benefits and costs must be determined based on factual data. It is incorrect to automatically take the market value of distributed clothing as net profit.

The degree of decrease or increase in waste is determined by comparing the amount of waste in the periods before and after the start of the project:

$$E = ((M0 - M1) / M0) \times 100\%$$

Here E is the degree of decrease in the amount of waste; M0 — the amount of waste recorded during the period preceding the start of the project; M1 is the amount of waste recorded in the period following the project implementation.

In this formula, if M1 < M0, the result indicates a decrease in waste. If M1 > M0, the result is negative and indicates an increase in waste. For the comparison to be accurate, it is necessary to use the same area, time interval, and accounting method in both periods.

Also, the effectiveness of a recycling project is assessed not only by how much clothing is collected, but also by how much of it is suitable for reuse, how many families it is delivered to, what costs are required, and how it affects the amount of waste. Initially, it is possible to justify the economic and environmental efficiency of the project by organizing a pilot project in individual mahallas, regularly collecting real statistical data, and comparing the results.

At the first stage, citizens' unused clothing, readiness to hand it over, and the need for free clothing will be studied by conducting a small survey in mahallas. At the same time, existing charitable initiatives and the possibility of receiving clothing will be analyzed.

In the second stage, a pilot project will be launched in several mahallas. Boxes will be installed, responsible persons will be appointed, and a procedure for collecting and distributing clothing will be developed. Accounting is maintained for the quantity, condition, and types of clothing.

In the third stage, the test results are analyzed. It assesses the amount of clothing collected, the proportion of products suitable for reuse, the number of families who received assistance, the cost of collecting and distributing one kilogram of clothing, and the estimated amount of money saved by the families.

In the fourth stage, it is proposed to expand the project to other mahallas only if it is recognized as effective. If the costs are high, the location of the boxes, the transport schedule, and cooperation mechanisms will be reviewed.

The main results of the project can be evaluated by the following criteria: the amount of clothing collected, the amount of clothing distributed free of charge, the number of families who received assistance, the proportion of clothing suitable for reuse, total costs, and user satisfaction. These indicators make it possible to distinguish the actual results of the initiative from assumptions.

CONCLUSIONS AND SUGGESTIONS

In conclusion, improving the system for collecting unused clothing and distributing it free of charge to the

needy population in Uzbekistan is a practical direction that combines environmental sustainability and social well-being. Existing experience shows that some forms of such initiatives have existed in the country before. Therefore, the main task of the proposed project is not to ignore existing initiatives, but to develop them as a regular, transparent, and measurable system at the mahalla level.

Through the project, it is possible to extend the service life of usable clothing, reduce waste, reduce clothing costs for low-income families, and develop a culture of mutual assistance among citizens. However, to achieve these results, it is necessary to properly organize the processes of sorting, hygienic preparation, safe storage, and fair distribution of clothing.

The SWOT analysis shows that alongside the strengths of the initiative, issues related to transportation costs, quality control, funding, and public trust must also be taken into account. Therefore, it is advisable to initially test the project in a limited area, measure its economic and environmental results, and expand only on the basis of practical evidence.

In general, it is possible to save resources, strengthen social support, and promote environmental responsibility by recycling old clothes. The success of the system depends not only on the quantity of clothing collected, but also on its reaching those who truly need it and the rational management of project costs.

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